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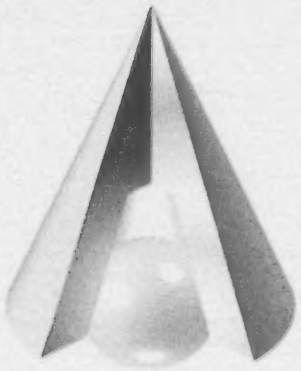
Educational and Labour Market Outcomes of Childhood Immigrants by Admission Class



by Feng Hou and Aneta Bonikowska

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.. not available for a specific reference period
... not applicable
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0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p} preliminary
^{r} revised
x suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E} use with caution
F too unreliable to be published
* significantly different from reference category ($p < 0.05$)

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by Feng Hou and Aneta Bonikowska
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Table of contents

Abstract **5**

Executive summary **6**

1 Introduction **8**

2 Contexts of arrival and the integration of children of immigrants **9**

3 Data and methods **12**

3.1 Data 12

3.2 Measures 12

3.3 Methods 15

4 Results **16**

4.1 Differences by admission class in background characteristics and outcomes 16

4.2 Accounting for the differences in outcomes by admission class 19

4.3 Age at arrival and differences in outcomes by admission class 24

4.4 Variations by source region within major admission classes 29

5 Conclusion and discussion **35**

6 Appendix **37**

References **41**

Abstract

It has been well documented that the children of immigrants in Canada outperform their peers with Canadian-born parents in educational attainment, and that the two groups have similar labour market outcomes. However, large variations by ethnicity or source country exist among the children of immigrants. This study examines the extent to which admission class (e.g., skilled workers, business immigrants, live-in caregivers, the family class and refugees) also matters in the socioeconomic outcomes of childhood immigrants who arrived in Canada before the age of 18. Using the 2011 National Household Survey, linked with the Immigrant Landing File, this study finds large differences by admission class in university completion rates and earnings for childhood immigrants aged 25 to 44. Children of skilled workers and business immigrants had the highest university completion rates and earnings. Children of live-in caregivers and in the family class had the lowest university completion rates, and children of live-in caregivers and refugees landed in Canada had the lowest earnings. The analysis shows that the admission class of immigrant parents matters to their children's outcomes partly through group differences in the education and official language ability of parents and partly through the unique pre- and post-migration circumstances experienced by each admission class.

Keywords: childhood immigrants, admission class, education, earnings

Executive summary

The children of immigrants who arrived in Canada over the past several decades outperform their peers with Canadian-born parents in educational attainment overall, and the two groups have similar labour market outcomes. However, large variations by ethnicity or source country have been observed among the children of immigrants. This heterogeneity has been interpreted as the result of differences in vulnerability and resources between immigrant groups, in terms of individual and family socioeconomic background—particularly education and official language ability—and group cultural and community characteristics. Few studies have systematically considered whether admission classes are additional sources of diversity in outcomes for the children of immigrants. Immigrants admitted through different classes differ not only in human capital and family economic resources, but also in motivations, pre-migration circumstances, host-country receptivity and post-migration experiences. These differences may have a bearing on the socioeconomic outcomes of the children of these immigrants.

This study examines the extent to which the admission classes of immigrant parents are associated with the educational and labour market outcomes of their children. Specifically, this study examines the educational attainment and earnings of childhood immigrants who arrived in Canada at age 17 or younger (the 1.5 generation) and whose parents entered Canada through different admission classes (e.g., as skilled workers, in the family class or as refugees). The study further explores some possible mechanisms through which admission class is associated with the outcomes of childhood immigrants, particularly the education and official language abilities of their parents, as well as the labour market performance of parents in the years when childhood immigrants were growing up in Canada. The analysis also considers whether differences in outcomes by admission class are smaller for childhood immigrants who arrived at a younger age.

This study is based on the 2011 National Household Survey (NHS) and the Immigrant Landing File (ILF) linkage, which matches immigrant NHS respondents who have landed in Canada since 1980 with immigrant landing records. The analysis focuses on childhood immigrants who arrived in Canada between 1980 and 2000 and were aged 25 to 44 at the time of the 2011 NHS. The 2011 NHS contains 90,601 observations that meet the study's sample selection criteria.

The results show that childhood immigrants from different admission classes attained very different levels of education, particularly in terms of completing a university degree, and this, in turn, led to large variations in average earnings by admission class. Childhood immigrants in the business class and skilled-worker class had the highest high-school graduation rates, university completion rates and annual earnings. Childhood immigrants in the live-in caregiver class had a university completion rate that was about one-third of the rate for the business class, and their average earnings were the lowest. Childhood immigrants in the family class also had a low university completion rate and low earnings. Furthermore, childhood immigrants in the live-in caregiver class and family class had lower university completion rates than Canadian-born children of non-immigrant parents. Children of refugees had a much lower university completion rate than those of immigrants in the business and skilled-worker classes, but they achieved a higher rate than those of immigrants in the live-in caregiver and family classes.

Differences by admission class in the educational outcomes of childhood immigrants were smaller for pre-school-aged arrivals than for adolescent arrivals. This pattern results primarily from the varying role of parents' ability in the official languages. While the official language proficiency of parents did not matter to pre-school-aged arrivals, its effect was substantial on adolescent arrivals. This suggests that early exposure to the host society helps to mitigate the effect of parents' lack of official language ability.

Less than one-half of the gap in university completion for childhood immigrants in the live-in caregiver class and family class was associated with their individual demographic characteristics and the family background factors available to this study, primarily source region and the

education of parents. Over one-half to two-thirds of the gap for children of government-assisted refugees and privately sponsored refugees was accounted for by the included covariates, primarily parents' education, language, and source region.

Overall, childhood immigrants' educational and earnings outcomes differed by the admission class of parents. The effects of the admission class of parents work partly through differences in parents' education and official language ability. Other possible mechanisms include factors that are specific to the unique pre- and post-migration circumstances experienced by each admission class.

1 Introduction

The children of immigrants who arrived in Canada over the past several decades outperform their peers with Canadian-born parents in educational attainment overall, and the two groups have similar labour market outcomes. However, large variations by ethnicity or source country have been observed among the children of immigrants (Boyd 2009; Picot and Hou 2010, 2011). For example, children of immigrants from the Philippines and the Caribbean tend to lag significantly behind children of immigrants from East and South Asia in completing university education (Abada, Hou and Ram 2009). This heterogeneity has been interpreted as the manifestation of the different pace or paths of integration experienced by various immigrant groups, as a result of their unique vulnerability and resources and of the different socioeconomic contexts they encounter in the host society (Portes and Zhou 1993; Alba and Nee 2003).

Many previous studies have examined immigrant vulnerability and resources in terms of individual and family socioeconomic background—particularly education and official language ability—and group cultural and community characteristics, yet few studies have systematically considered whether immigration admission classes are additional sources of diversity in outcomes for the children of immigrants (Bean et al. 2011; Meissner and Vertovec 2015). Immigrants admitted through different classes differ not only in human capital and family economic resources, but also in motivations, pre-migration circumstances, host-country receptivity and post-migration experiences. These differences may have a bearing on the socioeconomic outcomes of the children of these immigrants.

This study examines the extent to which the admission classes of immigrant parents matter for the educational and labour market outcomes of their children. Knowing whether and how admission classes of adult immigrants affect their children would help explain how the children of immigrants are successfully integrated into Canadian society. Specifically, this study examines the educational attainment and earnings of childhood immigrants who arrived in Canada, aged 17 or younger (the 1.5 generation), and whose parents entered Canada through different admission classes (e.g., as skilled workers, in the family class or as refugees). The study further explores some possible mechanisms through which admission class is associated with the outcomes of childhood immigrants, particularly the education and official language abilities of their parents, as well as the labour market performance of parents in the years when childhood immigrants were growing up in Canada. The analysis also considers whether differences in outcomes by admission class are smaller for childhood immigrants who arrived at a younger age. It is expected that earlier exposure to Canadian society mitigates the impact of admission classes on the children of immigrants.

The remainder of this paper is organized in four sections. Section 2 reviews the literature on the conceptual frameworks and empirical studies on heterogeneity among the children of immigrants. Section 3 discusses the data source, measures and analytical approaches. Section 4 presents descriptive statistics and multivariate analysis results. Section 5 concludes the paper.

2 Contexts of arrival and the integration of children of immigrants

The sustained high levels of immigration to Canada and some other developed countries over the past several decades have fueled intensive interest in the socioeconomic integration of immigrants and their children. Several major theoretical frameworks have been developed to explain and predict the processes and outcomes of immigrant integration.

The classical theory of immigrant assimilation originated from the experience of the great waves of southern and eastern European immigrants to the United States in the late nineteenth and early twentieth centuries (Farley and Alba 2002). Although many of these immigrants worked as manual labourers, their children pursued education, were able to take advantage of opportunities in an expanding economy, and were seamlessly incorporated into mainstream society. This remarkable intergenerational upward mobility promoted the optimistic view that exposure to the United States is all it takes for integration to occur and that ethnic background would have little socioeconomic consequence after one or two generations (Alba 1990; Lieberson and Waters 1988).

Since the 1960s, new waves of immigrants brought anomalies to the straight-line pattern of assimilation. Large variations in socioeconomic outcomes by ethnicity, race or source country have been observed among the children of immigrants (Boyd 2009; Kao and Thompson 2003; Portes and Rumbaut 2001). In accounting for the diverse experiences of different immigrant groups, researchers have considered a variety of factors, including the socioeconomic resources, race, culture and social capital of immigrant groups; continuous high levels of immigration; and institutional and structural changes in the United States. Alba and Nee (2003) argue that these factors would set up different speeds of integration for different immigrant groups. Despite the differences in pace, they expect that all immigrant groups will eventually be incorporated into the mainstream economy and mainstream society.

By comparison, the segmented assimilation theory posits that different paths of incorporation result from multifaceted interactions between factors intrinsic to an immigrant group and structural contexts in the receiving society. Group-intrinsic factors include financial and human capital upon arrival, pre-existing ethnic communities, and cultural values and norms. Structural contexts refer to racial stratification, economic opportunities and the socioeconomic environment of local communities where immigrants reside (Portes and Zhou 1993; Zhou 1997). In essence, groups with differences in vulnerability and resources are absorbed into different segments of U.S. society. This theoretical framework specifies at least three pathways. The first is traditional upward mobility. For some groups, increased exposure over time and across generations will lead to economic, sociocultural and spatial integration into middle-class America. The second is downward mobility, as some groups show convergence toward the precarious socioeconomic positions of the underclass. The third path is socioeconomic improvement across generations, with deliberate preservation of the immigrant community's values and solidarity (Portes, Fernandez-Kelly and Haller 2005; Zhou et al. 2008).

The above theoretical frameworks and related empirical studies have mostly been developed with an ethno-focal lens, by focusing on particular ethnic or national groups and the specific structural contexts these groups encounter in the receiving society. Little attention has been paid to whether and how admission classes constitute an additional source of differentiation for the children of immigrants.

Different migration types are essential to the concept of superdiversity (Vertovec 2007). The rapid diversification of international migration occurs not just in the changing composition of source countries, ethnicities, demographic characteristics and human capital factors, but also in the differentiation of migration types, such as permanent versus temporary flows, skilled workers, family reunification, international students and refugees. Migration types entail different

motivations, pre-migration circumstances, selection processes, legal status and host-country receptivity. Therefore, studying the impact of migration types and the intersection of these types with immigrant sociodemographic characteristics would provide a more nuanced understanding of the complicated processes of immigrant integration (Meissner and Vertovec 2015).

In Canada, admission class is a major government policy lever, and immigration program policy and class composition has been altered frequently to meet the main objectives of the *Immigration and Refugee Protection Act*. However, a key goal, with many changes observed over the past decade or so, has been improving the overall economic performance of new immigrants. Consequently, it is relevant for policy to understand not only how adult immigrants in different classes perform, but also whether and how the advantages or disadvantages associated with the admission class of parents are transmitted to their children.

In Canada, immigrants are admitted through three main classes: the economic class, the family class and refugees. These classes correspond to three of the main objectives of the nation's immigration policy: contributing to economic development, reuniting families and protecting refugees.

Economic immigrants are chosen for their skills and ability to contribute to Canada's economy and competitiveness. Over the study period, economic immigrants included primarily skilled workers, business immigrants and live-in caregivers. Skilled workers are selected through the points system, which assigns scores to immigrant applicants based on their education, English or French language ability, age and work experience, and on other indicators of their adaptability to the Canadian labour market. Business immigrants include those who invest in Canada and those who intend to be entrepreneurs or self-employed. Live-in caregivers are initially admitted as temporary foreign workers to care for children, the disabled or the elderly, and are eligible to apply for permanent residency after completing 24 months of paid employment.

The family-class immigrants are sponsored by close relatives or family members in Canada, and include spouses and partners, dependent children, parents and grandparents.

Refugees include government-assisted refugees, privately sponsored refugees, refugees landed in Canada, and dependants of refugees landed in Canada who live abroad (Citizenship and Immigration Canada 2012). Both government-assisted refugees and privately sponsored refugees initially seek protection from outside Canada. Once they arrive in Canada, they are provided with immediate and essential services and income support by government agencies, for the former, or by private sponsors (organizations or groups of individuals), for the latter. Refugees landed in Canada make their asylum claims upon or after arrival in Canada.

Immigrants in the various classes differ in pre-migration circumstances and the reasons for immigration. Economic immigrants may have a relatively high economic status and rich social resources in their source country, and they are likely to have high educational expectations and aspirations for their children (Ichou 2014). Their motivation for immigrating is to further improve their quality of life, and the quality of life of their children. Many immigrants in the family class, particularly children, may have experienced years of separation from their family members. The same is the case for children of live-in caregiver immigrants. Refugees were forced to leave their home country, and many have experienced persecution, violence and hardship, which may have long-term detrimental effects on their health and economic performance (Beiser 1999). Immigrants in different classes also tend to come from countries with different levels of socioeconomic development and cultural values towards education. These source-country effects can be transmitted to the children of immigrants through socialization processes within immigrant families (Blau et al. 2013; Fleischmann and Dronkers 2010).

There are also large variations by admission class in the family socioeconomic background of immigrants. Because they are screened for their potential to do well in the Canadian labour

market, skilled workers have the highest educational attainment and proficiency in English or French. The educational level of parents is one of the most important predictors of the educational attainment and labour market outcomes of children (Bonikowska and Hou 2010; Picot and Hou 2013). The official language ability of immigrant parents also strongly influences the language proficiency and educational outcomes of their children (Bleakley and Chin 2008). Business immigrants may not have the advantages in education and official language ability of skilled workers, but they often have the financial resources to settle in the local communities where the best schools are located and to provide their children with additional educational resources (Zhou 1997). Family environment and family social capital also differ by admission class. In particular, separation of children from their parents tends to be more prevalent for live-in caregivers than for other classes.

Immigrants in different classes also vary in their post-migration experiences in terms of how they are perceived and incorporated by the host society. On average, skilled-worker immigrants do better in the labour market than do business immigrants, family-class immigrants and refugees (Abbott and Beach 2012). Family-class immigrants tend to have higher labour force participation and are less likely to live in poverty than refugees, likely because they benefit from the financial support and social networks of their family (Hiebert 2009; Picot, Hou and Coulombe 2008). Because they are initially selected to provide domestic services, live-in caregiver immigrants have a high employment rate, but many find it difficult to find high-skilled jobs after acquiring permanent resident status, even though some of them have university degrees (Atanackovic and Bourgeault 2014). Success in the labour market creates more economic resources at the family level and affects where immigrant families reside.

Societal reception to various types of immigration may also vary. Skilled-worker immigrants have traditionally received a warm welcome and have been perceived as positive contributors to the Canadian economy and Canadian society (Reitz 2014). Refugees who are sponsored by private organizations may receive more individualized and localized support than do government-assisted refugees (Beiser 1999), while refugees landed in Canada may be subject to public skepticism of their asylum claims and resentment (Diop 2014; Opoku-Dapaah 1994).

This study includes pertinent indicators of potential mechanisms through which admission class affects the educational and labour market outcomes of childhood immigrants. Specifically, source region and source-country gross domestic product (GDP) per capita are used to measure pre-migration characteristics. The educational level of immigrant parents and their ability in official languages are used to measure family socioeconomic background. Family market income in the initial years after immigration and income growth over the first decade after immigration are used to measure post-migration experiences.

This study further includes important characteristics of childhood immigrants themselves, including age at arrival, years of residence in Canada, English or French as a mother tongue and visible minority status. This is certainly not an exhaustive list of possible factors that could explain the effects of admission class, but these factors are the commonly used indicators of immigrant vulnerability and resources. They have been shown to play a major role in accounting for group differences by ethnicity or source region in the socioeconomic outcomes of the children of immigrants. If these factors do not fully explain the effect of admission class, this would indicate that admission class constitutes an additional differentiating force in the integration of the children of immigrants.

3 Data and methods

3.1 Data

This study is based on the 2011 National Household Survey (NHS) and Immigrant Landing File (ILF) linkage, which matches immigrant NHS respondents who have landed in Canada since 1980 with immigrant landing records maintained by Citizenship and Immigration Canada.[1] About 79% of in-scope immigrants in the NHS were successfully linked to their landing records, and the linkage rate was higher for immigrants who arrived during the 1990s and early 2000s. This linkage strengthens the NHS as a source of data for immigration studies with the addition of immigrant entry characteristics, including admission class (e.g., skilled worker, refugee and family class), education at landing, intended occupation, intended destination and country of last permanent residence. The linkage file allows for comparisons by immigrant entry status of socioeconomic outcomes, including current educational attainment, employment, occupation and geographic distribution. In addition to the NHS–ILF linkage file, the Longitudinal Immigration Database (IMDB) is used to derive group-level characteristics for immigrant parents, as explained in detail in the next section. The IMDB combines immigrant landing records and annual tax records for immigrants who have arrived in Canada since 1980.

The analysis focuses on childhood immigrants who arrived in Canada aged 17 or younger and who were aged 25 to 44 at the time of the 2011 NHS. Most individuals in the selected age range have finished their schooling and are in their prime working age. The study further restricts the sample to childhood immigrants who arrived in Canada between 1980 and 2000. Landing records were not readily available for immigrants who arrived before 1980. Very few childhood immigrants who arrived after 2000 had reached age 25 by 2011, when educational and labour market outcomes were collected in the NHS.

The 2011 NHS contains 90,601 observations that meet the study's sample selection criteria, representing about 460,000 childhood immigrants who arrived between 1980 and 2000. Of the selected NHS observations, about 18,900, or 21%, were not linked with the ILF, so their admission class status could not be identified. This group of unlinked childhood immigrants is included in the analysis in a "class not identified" category.

3.2 Measures

For the NHS–ILF linked observations of childhood immigrants, nine broad admission classes are defined: (1) the skilled-worker class; (2) the business class, including entrepreneurs, the self-employed, investors and others; (3) live-in caregiver class; (4) the family class; (5) government-assisted refugees; (6) privately sponsored refugees; (7) refugees landed in Canada; (8) other refugees, including refugee dependants, humanitarian and compassionate cases, and backlog clearance program cases; and (9) others. Note that childhood immigrants in the family class are a highly heterogeneous group. They could be the children of immigrants who were admitted under the family class or the children of immigrants who previously arrived in any other class, including

1. The variables used as linkage keys include date of birth, given name and surname, postal code, landing year, sex, country of birth and mother tongue. Detailed methodology is described in an internal file, "CIC Landing File to Census 2011/NHS Linkage," prepared by Jim Brennan, Household Survey Methods Division, Statistics Canada.

skilled workers and refugees.[2] Future improvements to the ILF to include sponsor information for the family class will help differentiate the admission class of parents for childhood immigrants in the family class.

This study considers three indicators of socioeconomic outcomes of childhood immigrants: high-school graduation, university completion and annual employment earnings. High-school graduation is defined as having received a secondary school or high school diploma, graduation certificate, or their equivalent. University completion is defined as having received a university certificate, diploma or degree at the bachelor level or above. Employment earnings (measured in 2010 constant dollars) include total income received during 2010 as wages and salaries, and net self-employment income. While the full sample of childhood immigrants is used to examine the two educational outcomes, only individuals with minimum annual employment earnings of $500 who reported an occupation are included in the analysis of earnings.

To understand possible sources of any observed differences in outcomes by admission class, four sets of covariates are available from the data for multivariate modelling.

The first set contains the basic demographic characteristics of childhood immigrants, including age at arrival, years since immigration, sex, mother tongue, visible minority status and geographic location of residence. The age at arrival is split into three groups depending on whether immigration occurred during early childhood (ages 0 to 5), middle childhood (ages 6 to 12) or adolescence (ages 13 to 17). Some previous studies have shown that the effect of age at arrival on official language acquisition and educational outcomes is not linear, and there are clear gaps between immigrants who arrived at pre-school age, at primary-school age and in their adolescent years (Rumbaut 2004). Mother tongue is coded as English or French, or other. Visible minority status is coded as white or visible minority. Geographic location of residence is coded into seven categories: the Toronto, Montréal and Vancouver metropolitan areas; Ontario (excluding Toronto); Quebec (excluding Montréal); British Columbia (excluding Vancouver); Alberta; Manitoba and Saskatchewan; and the Atlantic region. Provinces with small populations are combined because the number of childhood immigrants in those regions is small.

The second set of covariates measures some pre-immigration contexts. It includes immigrant source region and source-country GDP per capita. Source regions are classified into 13 categories: the United States, the Caribbean, Central and South America, Northern Europe, Western Europe, Southern Europe, Eastern Europe, Africa, South Asia, Southeast Asia, East Asia, West Asia, and Oceania and other. This variable is included to separate the effect of admission class from the effect of the source region, since certain admission classes are concentrated in particular source regions. Source-country GDP per capita,[3] expressed in 2005 U.S. dollars, is used to represent the overall living standard of the source country at the time when the immigrants came to Canada. The yearly GDP data are matched to individual immigrants by year of arrival and source country.

2. In particular, live-in caregivers often brought their children not as dependants in the live-in caregiver class but in the family class. In the NHS–ILF linkage data, for instance, close to one-half (47%) of the childhood immigrants who still lived in a census family with a parent who was a live-in caregiver principal applicant arrived in the family class, while the other half arrived as dependants in the live-in caregiver class. About 92% of the childhood immigrants who still lived in a census family with a parent who was a skilled worker principal applicant arrived as dependants in the skilled-worker class, and only 8% arrived in the family class. The ILF does not distinguish between principal applicants and spouses and dependants for government-assisted and privately sponsored refugees. About 32% of government-assisted and privately sponsored refugees who arrived between 1980 and 2000 arrived aged 0 to 17, and another 18% arrived aged 18 to 24. This suggests that many childhood refugees arrived together with their parents. About 84% of childhood immigrants who still lived in a census family with a parent who was a government-assisted or privately sponsored refugee arrived as refugees, and 15% arrived in the family class.
3. GDP per capita data were extracted from the National Accounts Main Aggregates Database of the United Nations Statistics Division – National Accounts, http://unstats.un.org/unsd/snaama/Introduction.asp.

The third set of covariates measures family socioeconomic background. It includes the education of parents and their ability to speak English or French.

The fourth set of covariates measures the economic success of immigrant parents in the early years after immigration. It includes average family market income in the first two full years after immigration and the growth in family market income from the first two years to the 9th and 10th years.[4]

The NHS–ILF linkage data do not allow for linking the majority of childhood immigrants in the study sample directly to their parents.[5] Therefore, a group-level approach is used to link childhood immigrants to the education and official language ability of their fathers, measured at the time of landing, and to family market income at entry and market income growth. The average shares of fathers with university degrees and of fathers who speak English or French, the family market income (measured in 2010 constant dollars) in the first two full years after immigration, and the family income growth are calculated by combining admission class, landing year and source region (13 categories, as defined above) from the IMDB. The keys used to match the group data to childhood immigrants differ by admission class. For the skilled-worker, business, live-in caregiver and refugee classes, the keys are admission class, source region, and the year of landing. For the family class, "other" class and "class not identified," the keys are source region and the year of landing, because the admission class of parents cannot be identified from the data for these childhood immigrants.

The education and official language ability of fathers, rather than those of mothers, are used in the analysis, because fathers had higher average education levels than mothers in all classes, and there was a larger class difference in the education of fathers than in that of mothers.[6] In the study sample, mothers with a university degree tend to have a stronger effect on the educational outcomes of childhood immigrants than do fathers, while the effects of official language ability are similar for mothers and fathers (see Appendix Table 1). However, the characteristics of fathers and mothers play similar roles in accounting for differences by admission class in the educational outcomes of childhood immigrants.[7]

Previous studies suggest that the effect of the socioeconomic status of parents on the outcomes of children tends to be stronger when it is measured at the group level than when data have a direct parent–child link, particularly when income is used to measure the socioeconomic status of parents. The possible reason is that group data reduce random measurement errors and also measure ethnic capital (Borjas 1994, 1995). Using the subsample of childhood immigrants who can be directly linked to their fathers, this study finds that the effect of family market income on the education of children is stronger in the group-level matched data than in the directly matched data, but the effect of the father's education and official language ability are similar in the directly

4. Market income includes paid employment earnings, net self-employment income, investment income, dividends and net rental income. Negative market income is treated as zero in calculating the group average.
5. There are two possible ways to link childhood immigrants directly to their parents. One is to use the economic family or census family identifiers in the NHS to identify parents and the children who are still staying in their dwelling. However, the majority of childhood immigrants aged 25 to 44 no longer lived in the same dwelling as their parents at the time of the NHS. Alternatively, childhood immigrants who arrived with their parents shared the same application identification, which could be used as the key to link childhood immigrants to their parents. This approach does not work for childhood immigrants who did not apply for landed immigrant status at the same time as their parents (e.g., the family class). With the second approach, the characteristics of parents have to be derived from the ILF. Only about one-third of the childhood immigrants in the NHS can be linked in this way to their parents.
6. In the study sample, the share of fathers with a university degree is strongly correlated with the share of mothers $(r = 0.90)$, and the share of fathers speaking English or French is also strongly correlated with the share of mothers $(r = 0.95)$.
7. An exception is the live-in caregiver class. The education of fathers plays a larger role than that of mothers in accounting for the poorer educational outcomes of childhood immigrants in the live-in caregiver class relative to other classes. This is because fathers in the live-in caregiver class had a larger relative disadvantage in education than did the mothers.

matched and group-matched data (see Appendix Table 2 for details). Furthermore, in terms of accounting for differences by class in outcomes of childhood immigrants, the directly linked and group-linked factors of parents play similar roles.

In the models for earnings, two additional control variables are included. One is the educational attainment of childhood immigrants. It is coded into five categories: less than high school, high-school graduation, some postsecondary education, bachelor's degree, and graduate degree. The second control variable is occupation, coded into 12 categories: managerial; finance; business administration; natural science (professional); natural science (technical); health; social science; arts, cultural and recreation; sales and services; trades, transportation and equipment operator; primary industry; and manufacturing, processing and general labour.

3.3 Methods

In multivariate analysis, probit models are estimated for high-school graduation and university completion, as both are dichotomous variables. For earnings, ordinary least squares (OLS) regression models are used. For each outcome, two models are estimated. Model 1 only includes a series of dummy variables representing admission class, with skilled workers as the common reference group. This model presents the observed differences between admission classes in the outcome and shows the statistical significance of these differences. Model 2 adds all the covariates. For the earnings models, educational levels and occupation of childhood immigrants are also included. The changes in the coefficients of the dummy variables for admission class from Model 1 to Model 2 in the OLS regression, or in the marginal effects in the probit regression, indicate the portion of the observed differences in the outcome by admission class that is accounted for or "explained" by class differences in the covariates. The explained portion is further decomposed into the contribution of each covariate using a generalized form of the Oaxaca decomposition technique (Hou 2014).

The sampling weight of the NHS is used in all analysis. In the model with group-level variables, cluster-correction robust standard errors are calculated to take into account the dependence of observations within a cluster. The clusters are identified by the combination of admission class, year of immigration and source region.

4 Results

4.1 Differences by admission class in background characteristics and outcomes

Table 1 presents the sample size and some key demographic characteristics of childhood immigrants by admission class. Of the childhood immigrants in the study sample whose admission class was identified through the NHS–IFL linkage, 49% were children of economic immigrants, including skilled workers (36%), business immigrants (12%) and live-in caregivers (1%). Refugees accounted for 23% of the childhood immigrants, including government-assisted refugees (9%), privately sponsored refugees (6%), refugees landed in Canada (3%), and other refugees and the humanitarian class (5%). About 28% of childhood immigrants were in the family class. However, as discussed above, many of them might have been initially left behind in their source country and later came to join their parents who were economic immigrants or refugees.

Table 1
Demographic characteristics of childhood immigrants 25 to 44 years of age, by admission class

Admission class	Age at landing	Years since immigration	Visible minority	English/French mother tongue	Sample size
	years		percent		number
Skilled-worker class	10.1	20.8	65.0	34.5	26,160
Business class	11.3	20.0	83.0	18.3	8,369
Live-in caregiver class	13.1	17.1	95.4	18.2	530
Family class	11.7	21.2	79.0	29.5	19,994
Government-assisted refugees	8.9	23.2	68.8	11.8	6,125
Privately sponsored refugees	9.1	23.7	61.5	11.6	4,153
Refugees landed in Canada	11.7	18.0	84.0	15.8	1,888
Other refugees and humanitarian class	10.2	20.0	82.2	22.8	3,334
Others	11.0	21.8	79.6	29.2	1,148
Class not identified	10.1	22.8	70.5	33.9	18,900

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

The demographic characteristics of childhood immigrants differed by class (Table 1). Government-assisted and privately sponsored refugee children arrived in Canada at an average age of 9 years, compared with the average age at arrival of 13 for children of live-in caregivers. For other classes, the average age at arrival ranged from 10 to 12. Similarly, government-assisted and privately sponsored refugee children had stayed the most years in Canada, about six years more than the children of live-in caregivers.

Most childhood immigrants were members of visible minorities, reflecting the fact that more immigrants to Canada in the 1980s and 1990s came from Asia, Africa and Latin America than from Europe and the United States. The share of members of visible minorities was highest for children of live-in caregivers and lowest for children of skilled workers and privately sponsored refugees (Table 1). The majority of live-in caregivers were admitted from the Philippines, while the source-region composition was more diverse for skilled workers. Many privately sponsored refugees came from Eastern Europe.

Also related to source-region composition and admission criteria, there was a large variation by admission class in the share of immigrants who speak English or French as a mother tongue. Children of skilled workers and immigrants in the family class were most likely to speak English

or French as a mother tongue, while government-assisted and privately sponsored refugees were less likely to do so.

Childhood immigrants in different classes also differed in their family's pre- and post-migration characteristics. Skilled workers and business immigrants tended to come from countries that have higher GDP per capita than did immigrants in other classes (Table 2). Immigrant fathers in the skilled-worker class were the most educated, with 46% having a university degree. Government-assisted and privately sponsored refugee fathers were the least educated, with less than 15% having a university degree. About three-quarters of government-assisted and privately sponsored refugee fathers did not speak English or French at the time of landing, compared with less than one-fifth of immigrant fathers in the skilled-worker class or live-in caregiver class (Table 2).

Table 2
Family background characteristics of childhood immigrants, by admission class

Admission class	Log GDP per capita in source country	Fathers with university degree at landing	Fathers not speaking English or French	Average family market income at entry	Family income growth in the first decade after immigration
	log points	percent		2010 constant dollars	ratio
Skilled-worker class	8.20	46.04	16.53	49,500	1.67
Business class	8.61	27.70	40.75	30,800	1.53
Live-in caregiver class	7.13	17.47	15.10	44,400	1.59
Family class	7.33	24.43	29.76	37,600	1.59
Government-assisted refugees	7.15	14.77	74.18	22,100	2.19
Privately sponsored refugees	6.86	13.52	76.67	29,000	1.77
Refugees landed in Canada	7.09	19.14	12.56	17,700	2.23
Other refugees and humanitarian class	7.54	17.19	33.45	32,900	1.56
Others	7.83	28.15	27.39	42,500	1.40
Class not identified	7.70	26.40	31.50	41,000	1.54

Note: GDP stands for gross domestic product.

Source: Statistics Canada, authors' calculations based on data from the Longitudinal Immigration Database.

Furthermore, economic performance after immigration varied considerably by class for the parents of childhood immigrants. Immigrant families in the skilled-worker class had the highest real market income in the first two years after immigration, followed by families in the live-in caregiver and family classes (Table 2). Families of government-assisted refugees and refugees landed in Canada had the lowest initial family market income, but had the fastest income growth in the first decade after immigration. Business immigrant families had low initial market income and slow income growth.

Childhood immigrants in different classes also had different educational and earnings outcomes (Table 3). In terms of high-school graduation rates, childhood immigrants did better overall than the third generation or higher, which consists of children of two Canadian-born parents. However, they did less well than the second generation (Canadian-born children of two immigrant parents) and the 2.5 generation (Canadian-born children of one Canadian-born parent and one immigrant parent). Of the childhood immigrants, those in the business and skilled-worker classes had the highest rate, which was about 8 to 9 percentage points higher than the rate for the family class.

Table 3

Educational and labour market outcomes for childhood immigrants 25 to 44 years of age, by admission class

	High-school graduation rate			University completion rate			Earnings among non-trivial earners		
	Mean	Lower 95% confidence limit	Upper 95% confidence limit	Mean	Lower 95% confidence limit	Upper 95% confidence limit	Mean	Lower 95% confidence limit	Upper 95% confidence limit
	percent						2010 constant dollars		
Admission class									
Skilled-worker class	96.2	95.9	96.4	49.7	49.1	50.3	46,400	45,900	46,900
Business class	97.8	97.5	98.1	58.9	57.9	60.0	46,700	45,700	47,600
Live-in caregiver class	93.3	91.1	95.4	19.0	15.7	22.4	33,500	31,500	35,400
Family class	88.3	87.9	88.8	21.3	20.7	21.8	39,200	38,800	39,700
Government-assisted refugees	91.0	90.3	91.7	28.7	27.6	29.8	41,100	40,200	42,000
Privately sponsored refugees	91.2	90.4	92.1	31.7	30.3	33.1	43,900	42,700	45,100
Refugees landed in Canada	91.4	90.1	92.6	29.4	27.4	31.5	35,400	33,800	36,900
Other refugees and humanitarian class	89.5	88.4	90.5	25.8	24.3	27.3	36,400	35,300	37,500
Others	88.6	86.8	90.4	34.8	32.1	37.6	44,000	41,600	46,500
Class not identified	88.0	87.5	88.4	31.2	30.5	31.9	43,400	42,800	43,900
Childhood immigrants – total	91.6	91.4	91.8	35.9	35.5	36.2	42,900	42,700	43,200
Second generation	94.9	94.8	95.0	40.6	40.4	40.8	49,600	49,400	49,900
2.5 generation	93.3	93.1	93.4	33.8	33.6	34.1	49,300	49,000	49,500
Third generation or higher	88.8	88.8	88.9	24.4	24.3	24.5	46,100	46,000	46,200

Notes: The second generation includes those who were born in Canada to two immigrant parents. The 2.5 generation includes those who were born in Canada to one immigrant parent and one Canadian-born parent. Non-trivial earners are those who earned more than $500 annually.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

The group difference was even more pronounced in university completion rates (Table 3). On average, about 35.9% of childhood immigrants aged 25 to 44 had a university degree, a rate higher than the 33.8% for the 2.5 generation and the 24.4% for the third generation or higher, but lower than the 40.6% for the second generation. For childhood immigrants, the university completion rate was as high as 58.9% in the business class and 49.7% in the skilled-worker class. By comparison, only about one in five childhood immigrants in the live-in caregiver class and family class completed university education.

There were also large differences by admission class in annual earnings for childhood immigrants with non-trivial annual earnings (i.e., those who earned more than $500).[8] At the top of the distribution, childhood immigrants in the business class and the skilled-worker class earned on average $46,700 and $46,400 in 2010, respectively (Table 3). At the lower end, children of live-in caregivers and refugees landed in Canada earned $33,500 and $35,400 in 2010, respectively, or 28% and 24% lower than the level for children of skilled workers. In the middle range, childhood immigrants in the family class earned slightly less than the children of government-assisted and privately sponsored refugees.

Some of the above observed group differences in educational attainment and earnings are likely related to group differences in the demographic characteristics of childhood immigrants, as well as in their family pre- and post-migration resources. This relationship is examined with multivariate modelling in the next section.

4.2 Accounting for the differences in outcomes by admission class

The two leftmost columns of Table 4 report estimated marginal effects from probit models for high-school graduation. The marginal effect for a categorical variable is the difference in the predicted average rates of high-school graduation between the given category and the reference group.[9] For instance, in Model 2, the marginal effect associated with the family class implies that the predicted high-school graduation rate for childhood immigrants in the family class is 0.058, or 5.8 percentage points, lower than that for the skilled-worker class when group differences in the selected covariates are taken into account. For continuous variables, the marginal effect reflects changes in the predicted average high-school graduation rates associated with a one-unit change in the explanatory variable.

8. There were also group differences in the percentage of immigrants with non-trivial annual earnings. Childhood immigrants in the skilled-worker class had the highest percentage, at 86%. Childhood immigrants in the "other refugees and humanitarian class" group had the lowest percentage, at 79%. For the remaining groups, the percentage ranged from 80% to 84%.
9. The average marginal effect is the average over the sample values of the marginal effects calculated for each observation.

Table 4
Marginal effects from probit models on high-school graduation and university completion for childhood immigrants 25 to 44 years of age

	High-school graduation		University completion	
	Model 1	Model 2	Model 1	Model 2
	marginal effect			
Business class	0.016 ***	0.024 ***	0.092 ***	0.074 ***
Live-in caregiver class	-0.029 *	-0.001	-0.307 ***	-0.170 ***
Family class	-0.078 ***	-0.058 ***	-0.284 ***	-0.189 ***
Government-assisted refugees	-0.051 ***	-0.013	-0.210 ***	-0.079 ***
Privately sponsored refugees	-0.049 ***	-0.017 *	-0.180 ***	-0.076 ***
Refugees landed in Canada	-0.048 ***	-0.035 **	-0.203 ***	-0.134 ***
Other refugees and humanitarian class	-0.067 ***	-0.027 ***	-0.239 ***	-0.121 ***
Others	-0.076 ***	-0.053 **	-0.149 ***	-0.108 ***
Class not identified	-0.082 ***	-0.054 ***	-0.185 ***	-0.107 ***
Female	...	0.027 ***	...	0.083 ***
0 to 5 years of age at landing	...	0.032 ***	...	0.084 ***
6 to 12 years of age at landing	...	0.026 ***	...	0.054 ***
Years since immigration	...	0.001 *	...	0.004 ***
English or French mother tongue	...	0.028 ***	...	0.013 *
Visible minority	...	0.067 ***	...	0.056 ***
Caribbean	...	0.001	...	-0.107 ***
Central and South America	...	-0.049 **	...	-0.104 ***
Northern Europe	...	0.039 ***	...	-0.031
Western Europe	...	0.047 ***	...	0.018
Southern Europe	...	0.010	...	-0.029
Eastern Europe	...	0.076 ***	...	0.149 ***
Africa	...	0.022	...	0.035
South Asia	...	0.000	...	0.047 *
Southeast Asia	...	-0.009	...	-0.027
East Asia	...	0.029	...	0.209 ***
West Asia	...	0.008	...	0.062 **
Oceania and other	...	0.006	...	-0.118 ***
Family market income at entry (logged)	...	0.007	...	0.022
Family income growth	...	0.025 ***	...	0.041 ***
Fathers with university degree at landing	...	0.067 ***	...	0.108 ***
Fathers not speaking English or French	...	-0.030 ***	...	-0.075 ***
Source-country gross domestic product per capita (logged)	...	0.003	...	0.008 ***
		value		
Pseudo R squared	0.037	0.099	0.053	0.102

... not applicable
* significantly different from reference category ($p<0.05$)
** significantly different from reference category ($p<0.01$)
*** significantly different from reference category ($p<0.001$)

Notes: Model 2 also controls for geographic region of residence. The sample size is 90,601. The reference group is 'skilled workers' for immigration class, 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, and 'United States' for source region.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Model 1 in the leftmost column of Table 4 shows that the observed differences in high-school graduation rates between childhood immigrants in the skilled-worker class (the reference group) and those in the other classes were all statistically significant. In Model 2, the marginal effects associated with live-in caregivers and government-assisted and privately sponsored refugees became not significant or very small. This suggests that the gaps between the childhood immigrants in these classes and those in the skilled-worker class were mostly accounted for by individual sociodemographic variables and group-level factors.

Further decomposition analysis, as presented in Table 6, shows that the lower educational level of parents and source-region concentration played a major role in accounting for the gap of children of live-in caregivers. In addition, the lower educational level of parents and the higher share of them not speaking English or French were two main factors explaining the gap of children of government-assisted and privately sponsored refugees. By comparison, the gap of childhood immigrants in the family class was mostly unaffected after adjusting for individual sociodemographic variables and group-level covariates. This likely reflects the fact that many childhood immigrants in the family class were not appropriately matched to the characteristics of their parents because of data limitations, as discussed in the above section on measures.

Separate analyses by sex, as reported in Appendix Table 3, show that the differences in high-school graduation by class were generally consistent for men and women, with the exception of the live-in caregiver class and refugees landed in Canada. In both cases, mainly male childhood immigrants experienced large gaps in high-school graduation.

The estimated marginal effects from probit models for university completion are presented in the two rightmost columns of Table 4. Compared with the patterns observed for high-school graduation, group differences in university completion were very large. The gaps were particularly large for childhood immigrants in the live-in caregiver and family classes. Some, but not all, of the group differences in university completion were associated with individual sociodemographic characteristics and the socioeconomic factors of parents. The included covariates accounted for over one-half to two-thirds of the gap in university completion rates of children of government-assisted and privately sponsored refugees, but only accounted for about one-third of the gap of childhood immigrants in the family class and 45% of the gap in the live-in caregiver class (Table 6).

The detailed decomposition results, as presented in Table 6, show that for government-assisted and privately sponsored refugees, the educational attainment and official language ability of parents played a major role in accounting for the gaps in university completion of children. For childhood immigrants in the family and live-in caregiver classes, source region and the educational attainment of parents played the most important part in accounting for the gaps in university completion of children. The majority of live-in caregivers came from the Philippines; relative to skilled workers, a much higher share of family-class immigrants came from the Caribbean, Central and South America, and Southeast Asia. Children of immigrants from these regions were found to have relatively low university completion rates (see Abada, Hou and Ram [2009]; see also the marginal effects for the source-region dummy variables in Table 4).

Separate analyses for men and women show that the class differences in university completion were generally consistent for men and women, although the effects of some covariates were different (Appendix Table 3). While younger age at arrival was associated with a much higher university completion rate for female childhood immigrants than for male childhood immigrants, years since immigration had a stronger effect on men than on women. Family market income and income growth after immigration had stronger effects on female childhood immigrants than on male childhood immigrants.

Table 5 presents estimates of OLS regressions with log earnings as the dependent variable for childhood immigrants with positive earnings. Childhood immigrants in the live-in caregiver class or who were refugees landed in Canada had the largest earnings gaps with those in the skilled-worker class. After adjusting for individual characteristics and family background, the observed large group differences in earnings became either not statistically significant or much smaller.

Decomposition analysis shows that the education and occupation of childhood immigrants were the two major factors that accounted for class differences in earnings (Table 6). Childhood immigrants in the skilled-worker class and business class were overrepresented in high-paying occupations, including managerial, finance, natural science (professional), and social science occupations, while

childhood immigrants in the live-in caregiver class or who were refugees landed in Canada were overrepresented in low-paying occupations, such as sales and services. The socioeconomic status of immigrant parents did not play a large direct role in accounting for class differences in earnings. Since family background, particularly the education and official language ability of parents, affects the educational attainment of childhood immigrants, its influence on the earnings of childhood immigrants works mostly through the children's educational attainment.

Table 5
Ordinary least squares regression models on earnings of childhood immigrants 25 to 44 years of age

	Model 1	Model 2
	log earnings	
Intercept	10.411 ***	9.597 ***
Business class	-0.026	-0.024
Live-in caregiver class	-0.278 ***	-0.102 *
Family class	-0.145 ***	-0.019
Government-assisted refugees	-0.116 ***	-0.022
Privately sponsored refugees	-0.049 **	-0.027
Refugees landed in Canada	-0.314 ***	-0.086 ***
Other refugees and humanitarian class	-0.209 ***	-0.021
Others	-0.038	0.009
Class not identified	-0.075 ***	-0.022 *
Female	...	-0.245 ***
0 to 5 years of age at landing	...	-0.368 ***
6 to 12 years of age at landing	...	-0.140 ***
Years since immigration	...	0.035 ***
English or French mother tongue	...	0.020 *
Visible minority	...	-0.018
Less than high school	...	-0.448 ***
High-school graduation	...	-0.338 ***
Some postsecondary education	...	-0.211 ***
Bachelor's degree	...	-0.023 *
Caribbean	...	0.022
Central and South America	...	0.116 ***
Northern Europe	...	0.087 **
Western Europe	...	0.039
Southern Europe	...	0.166 ***
Eastern Europe	...	0.156 ***
Africa	...	0.108 ***
South Asia	...	0.137 ***
Southeast Asia	...	0.189 ***
East Asia	...	0.088 **
West Asia	...	0.102 ***
Oceania and other	...	0.090 *
Family market income at entry (logged)	...	0.054 ***
Family income growth	...	0.017
Fathers with university degree at landing	...	-0.112 ***
Fathers not speaking English or French	...	-0.046 *
Source-country gross domestic product per capita (logged)	...	0.020 ***
	value	
R squared	0.006	0.177

... not applicable
* significantly different from reference category ($p<0.05$)
** significantly different from reference category ($p<0.01$)
*** significantly different from reference category ($p<0.001$)

Notes: Model 2 also controls for geographic regions of residence. The sample size is 73,764. The reference group is 'skilled workers' for immigration class, 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, 'graduate degree' for educational attainment and 'United States' for source region.
Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Table 6
Observed and adjusted differences with childhood immigrants in the skilled-worker class in high-school graduation, university completion and earnings

	Business class	Live-in caregiver class	Family class	Government-assisted refugees	Privately sponsored refugees	Refugees landed in Canada	Other refugees and humanitarian class
				percentage points			
High-school graduation							
Observed difference	1.6	-2.9	-7.8	-5.1	-4.9	-4.8	-6.7
Adjusted difference	2.4	-0.1	-5.8	-1.3	-1.7	-3.5	-2.7
"Explained" portion	-0.8	-2.8	-2.0	-3.8	-3.2	-1.3	-4.0
				percent			
Relative contribution to the "explained" portion							
Demographic	...	-27.7	-27.3	-4.0	3.5	-29.9	-23.3
Language	...	11.2	5.4	13.0	17.4	25.9	7.2
Source region	...	71.6	39.8	29.7	-29.7	65.5	53.6
Parents' earnings	...	6.1	16.8	-13.5	4.6	-31.7	14.3
Parents' education	...	38.1	45.8	34.7	48.0	72.5	34.8
Parents' language	...	-1.2	17.0	38.6	53.6	-6.5	12.3
Source-country GDP	...	2.0	2.6	1.6	2.7	4.1	1.1
				percentage points			
University completion							
Observed difference	9.2	-30.7	-28.4	-21.0	-18.0	-20.3	-23.9
Adjusted difference	7.4	-17.0	-18.9	-7.9	-7.6	-13.4	-12.1
"Explained" portion	1.8	-13.7	-9.5	-13.1	-10.5	-6.9	-11.8
				percent			
Relative contribution to the "explained" portion							
Demographic	...	9.0	-4.8	-10.0	-11.8	6.4	-10.2
Language	...	1.4	0.6	2.2	2.7	3.8	1.3
Source region	...	58.0	49.2	40.0	8.4	31.6	51.0
Family market income	...	3.1	9.9	-2.5	7.0	-2.5	12.5
Parents' education	...	22.7	25.6	27.0	35.2	50.1	28.3
Parents' language	...	-0.8	11.4	36.2	47.3	-5.4	12.0
Source-country GDP	...	6.6	8.1	7.1	11.3	16.1	5.0
				log points			
Earnings							
Observed difference	-0.026	-0.278	-0.145	-0.116	-0.049	-0.314	-0.209
Adjusted difference	-0.024	-0.102	-0.019	-0.022	-0.027	-0.086	-0.021
"Explained" portion	-0.002	-0.176	-0.125	-0.095	-0.022	-0.228	-0.189
				percent			
Relative contribution to the "explained" portion							
Demographic	...	32.9	-30.6	-45.8	...	34.4	18.1
Language	...	2.1	0.9	5.0	...	1.7	1.3
Source region	...	-32.6	-1.4	-30.4	...	-1.6	3.7
Family market income	...	2.4	12.4	38.4	...	19.4	13.6
Parents' education	...	-17.5	-18.9	-36.5	...	-13.0	-16.9
Parents' language	...	-0.3	4.9	28.0	...	-0.7	4.1
Source-country GDP	...	13.1	14.0	22.1	...	9.7	7.2
Education	...	55.5	72.3	67.2	...	25.6	37.3
Occupation	...	44.5	46.3	51.9	...	24.5	31.7

... not applicable

Notes: GDP stands for gross domestic product. The difference between the observed difference and the adjusted difference may not correspond to the value shown for the explained portion because of rounding.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Separate analyses by sex show that the class differences in earnings were generally larger for women than for men. In particular, relative to the skilled-worker class, the gaps of childhood immigrants in the family class, government-assisted refugees, and privately sponsored refugees were twice as large for women as for men (Appendix Table 4). However, the adjusted class differences were broadly similar for women and men.

4.3 Age at arrival and differences in outcomes by admission class

Table 7 presents the marginal effects of probit models on high-school graduation, estimated separately for childhood immigrants who arrived in their early childhood (ages 0 to 5), middle childhood (ages 6 to 12) and adolescence (ages 13 to 17). The observed class differences were smaller for those who arrived in early childhood and middle childhood than for those who arrived in adolescence. The adjusted class differences, however, were generally similar across the groups by age at landing. This is because the included covariates did not account for much of the observed class differences in high-school graduation rates for those who arrived in early childhood and middle childhood, but accounted for a large portion of the observed gaps for several groups of adolescent arrivals. In particular, the official language ability of fathers was not significantly associated with children's high-school graduation for the two younger age groups, but its effect was significant on adolescent arrivals. Furthermore, the effects of the education of fathers and family income growth were stronger on adolescent arrivals than on the younger arrivals.

Table 7
Marginal effects from probit models on high-school graduation, by age at landing

	0 to 5 years of age at landing		6 to 12 years of age at landing		13 to 17 years of age at landing	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	marginal effect					
Business class	0.008	0.001	0.015 **	0.017 **	0.020 ***	0.043 ***
Live-in caregiver class	0.037	0.058	-0.019	0.000	-0.033	0.002
Family class	-0.057 ***	-0.059 ***	-0.061 ***	-0.050 ***	-0.094 ***	-0.060 ***
Government-assisted refugees	-0.029 ***	-0.022 *	-0.037 ***	-0.006	-0.098 ***	-0.033 *
Privately sponsored refugees	-0.019	-0.035 *	-0.038 ***	-0.013	-0.096 ***	-0.016
Refugees landed in Canada	-0.041	-0.054	-0.033 ***	-0.033 *	-0.060 ***	-0.038 *
Other refugees and humanitarian class	-0.047 ***	-0.024	-0.059 ***	-0.029 **	-0.085 ***	-0.023
Others	-0.068 *	-0.023	-0.044 *	-0.029	-0.099 ***	-0.077 **
Class not identified	-0.083 ***	-0.057 ***	-0.079 ***	-0.055 ***	-0.084 ***	-0.048 ***
Female	...	0.034 ***	...	0.025 ***	...	0.026 ***
Years since immigration	...	0.001	...	0.002 **	...	0.001
English or French mother tongue	...	0.022 **	...	0.023 ***	...	0.034 ***
Visible minority	...	0.059 ***	...	0.073 ***	...	0.051 ***
Caribbean	...	0.012	...	-0.040	...	0.022
Central and South America	...	-0.078 *	...	-0.071 ***	...	-0.030
Northern Europe	...	0.058 **	...	0.010	...	0.043
Western Europe	...	0.049 *	...	0.014	...	0.068 *
Southern Europe	...	-0.018	...	-0.008	...	0.013
Eastern Europe	...	0.072 ***	...	0.048 **	...	0.083 **
Africa	...	0.028	...	0.009	...	0.017
South Asia	...	0.024	...	-0.015	...	-0.002
Southeast Asia	...	0.006	...	-0.040 *	...	-0.001
East Asia	...	0.045 *	...	0.005	...	0.030
West Asia	...	0.027	...	-0.013	...	-0.001
Oceania and other	...	0.028	...	-0.037	...	0.027
Family market income at entry (logged)	...	-0.001	...	0.006	...	0.004
Family income growth	...	0.013	...	0.016 *	...	0.043 ***
Fathers with university degree at landing	...	0.056 *	...	0.056 ***	...	0.085 ***
Fathers not speaking English or French	...	0.012	...	-0.022	...	-0.057 ***
Source-country gross domestic product per capita (logged)	...	0.000	...	0.005 *	...	0.004
	value					
Pseudo R squared	0.033	0.128	0.037	0.100	0.041	0.095

... not applicable

* significantly different from reference category ($p<0.05$)

** significantly different from reference category ($p<0.01$)

*** significantly different from reference category ($p<0.001$)

Notes: Model 2 also controls for geographic region of residence. The sample size is 15,444 for 0 to 5 years of age, 39,287 for 6 to 12 years of age, and 35,870 for 13 to 17 years of age. The reference group is 'skilled workers' for immigration class, 'male' for sex, 'other mother tongues' for mother tongue and 'United States' for source region.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Similarly, the observed class differences in university completion rates were larger for older arrivals, with the exception of children of live-in caregivers (Table 8). For instance, the observed gap in university completion rates between children of government-assisted refugees and of skilled workers was 19.8 percentage points for pre-school-aged arrivals, compared with 25.4 percentage points for adolescent arrivals. The corresponding gaps for privately sponsored refugee children were 10.7 percentage points for pre-school-aged arrivals and 27.0 percentage points for adolescent arrivals. However, the adjusted class differences were generally consistent across the three age groups. The included covariates accounted for more of the observed class

differences for adolescent arrivals than for younger arrivals. Particularly, fathers' lack of ability to speak an official language had no negative effect on the university completion of pre-school-aged arrivals, but the effect was substantial for children who arrived at school age. It seems that early exposure to Canadian society (most likely the education system) mitigates the negative effect of parents lacking official language skills on the educational outcomes of childhood immigrants. Conversely, the effects of the education of fathers and family income were consistent across the groups by age at arrival.

Table 8
Marginal effects from probit models on university completion, by age at landing

	0 to 5 years of age at landing		6 to 12 years of age at landing		13 to 17 years of age at landing	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	marginal effect					
Business class	0.054 *	0.030	0.105 ***	0.070 ***	0.097 ***	0.080 ***
Live-in caregiver class	-0.342 ***	-0.237 *	-0.294 ***	-0.186 ***	-0.294 ***	-0.146 ***
Family class	-0.223 ***	-0.187 ***	-0.265 ***	-0.186 ***	-0.301 ***	-0.188 ***
Government-assisted refugees	-0.198 ***	-0.114 ***	-0.199 ***	-0.065 **	-0.254 ***	-0.089 ***
Privately sponsored refugees	-0.107 ***	-0.089 ***	-0.170 ***	-0.064 *	-0.270 ***	-0.110 ***
Refugees landed in Canada	-0.154 **	-0.105 *	-0.172 ***	-0.143 ***	-0.228 ***	-0.146 ***
Other refugees and humanitarian class	-0.215 ***	-0.124 ***	-0.225 ***	-0.122 ***	-0.265 ***	-0.130 ***
Others	-0.238 ***	-0.146 ***	-0.120 ***	-0.084 *	-0.126 ***	-0.112 ***
Class not identified	-0.182 ***	-0.132 ***	-0.177 ***	-0.108 ***	-0.194 ***	-0.098 ***
Years since immigration	...	0.125 ***	...	0.098 ***	...	0.049 ***
Female	...	0.006 ***	...	0.005 ***	...	0.002 **
English or French mother tongue	...	0.002	...	0.007	...	0.022 **
Visible minority	...	0.118 ***	...	0.061 ***	...	0.016
Caribbean	...	-0.041	...	-0.152 ***	...	-0.154 ***
Central and South America	...	-0.056	...	-0.135 ***	...	-0.144 ***
Northern Europe	...	0.046	...	-0.067 *	...	-0.086 **
Western Europe	...	0.155 ***	...	-0.035	...	-0.063
Southern Europe	...	-0.066	...	-0.053	...	-0.050
Eastern Europe	...	0.298 ***	...	0.123 ***	...	0.049
Africa	...	0.119 **	...	0.029	...	-0.051
South Asia	...	0.158 ***	...	0.042	...	-0.029
Southeast Asia	...	0.035	...	-0.054	...	-0.080 *
East Asia	...	0.207 ***	...	0.198 ***	...	0.153 ***
West Asia	...	0.175 ***	...	0.034	...	-0.012
Oceania and other	...	-0.009	...	-0.157 ***	...	-0.184 ***
Family market income at entry (logged)	...	0.093 **	...	0.014	...	-0.011
Family income growth	...	0.039 *	...	0.040 **	...	0.028 **
Fathers with university degree at landing	...	0.090 *	...	0.088 **	...	0.110 ***
Fathers not speaking English or French	...	0.003	...	-0.097 ***	...	-0.107 ***
Source-country gross domestic product per capita (logged)	...	0.006	...	0.008	...	0.010 **
	value					
Pseudo R squared	0.030	0.097	0.047	0.099	0.072	0.111

... not applicable
* significantly different from reference category (p<0.05)
** significantly different from reference category (p<0.01)
*** significantly different from reference category (p<0.001)

Notes: Model 2 also controls for geographic region of residence. The sample size is 15,444 for 0 to 5 years of age, 39,287 for 6 to 12 years of age, and 36,870 for 13 to 17 years of age. The reference group is 'skilled workers' for immigration class, 'male' for sex, 'other mother tongues' for mother tongue, and 'United States' for source region.
Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

In terms of earnings, there was a clear pattern of an increasing gap with age at arrival for children of live-in caregivers (Table 9). The earnings gap between children of live-in caregivers and children of skilled workers was −0.099 log points (the earnings of the former were approximately 9.4% lower than those of the latter) for pre-school-aged arrivals. The gap increased to −0.339 log points (or approximately 28.8%) for adolescent arrivals. To a lesser extent, similar patterns were observed for childhood immigrants in the family class and government-assisted refugee class. However, the adjusted class differences in earnings were generally small and there was no consistent pattern by age at arrival. The effects of some covariates were stronger for adolescent arrivals than for younger arrivals. The negative effect of parents lacking official language ability was large for adolescent arrivals but not significant for younger arrivals. Family income growth in the first decade after immigration had a significant effect on adolescent arrivals but not on the younger arrivals. In addition, the earnings returns on education for childhood immigrants were larger for older arrivals. Put differently, the penalty in earnings for low levels of education was more severe for older arrivals.

Table 9
Regression models on earnings, by age at landing

	0 to 5 years of age at landing		6 to 12 years of age at landing		13 to 17 years of age at landing	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	log earnings					
Intercept	10.307 ***	9.698 ***	10.421 ***	9.121 ***	10.453 ***	9.608 ***
Business class	0.047	0.053	-0.036	-0.013	-0.062 **	-0.062 **
Live-in caregiver class	-0.099	-0.011	-0.249 **	-0.011	-0.339 ***	-0.168 **
Family class	-0.128 ***	0.005	-0.157 ***	-0.013	-0.167 ***	-0.033 *
Government-assisted refugees	-0.077 **	-0.051	-0.098 ***	-0.003	-0.131 ***	-0.046
Privately sponsored refugees	-0.012	-0.008	-0.066 **	-0.050	-0.020	0.001
Refugees landed in Canada	-0.331 ***	-0.129	-0.444 ***	-0.147 ***	-0.218 ***	-0.027
Other refugees and humanitarian class	-0.256 ***	-0.033	-0.205 ***	-0.026	-0.193 ***	-0.012
Others	-0.037	0.050	-0.046	-0.003	-0.036	0.000
Class not identified	-0.041	0.015	-0.054 ***	-0.015	-0.116 ***	-0.058 ***
Years since immigration	...	0.044 ***	...	0.034 ***	...	0.033 ***
Female	...	-0.215 ***	...	-0.221 ***	...	-0.286 ***
English or French mother tongue	...	-0.026	...	0.013	...	0.057 ***
Visible minority	...	0.007	...	-0.002	...	-0.049 *
Less than high school	...	-0.336 ***	...	-0.413 ***	...	-0.521 ***
High-school graduation	...	-0.292 ***	...	-0.318 ***	...	-0.387 ***
Some postsecondary education	...	-0.118 ***	...	-0.189 ***	...	-0.282 ***
Bachelor's degree	...	-0.004	...	-0.022	...	-0.029
Caribbean	...	-0.194 **	...	0.155 **	...	-0.055
Central and South America	...	0.003	...	0.234 ***	...	0.016
Northern Europe	...	0.074	...	0.194 ***	...	-0.035
Western Europe	...	-0.006	...	0.127 *	...	-0.057
Southern Europe	...	0.157 *	...	0.249 ***	...	0.063
Eastern Europe	...	0.058	...	0.256 ***	...	0.075
Africa	...	-0.081	...	0.257 ***	...	0.027
South Asia	...	-0.028	...	0.279 ***	...	0.061
Southeast Asia	...	0.014	...	0.293 ***	...	0.141 *
East Asia	...	-0.022	...	0.204 ***	...	0.011
West Asia	...	-0.019	...	0.248 ***	...	-0.005
Oceania and other	...	-0.052	...	0.205 **	...	0.027
Family market income at entry (logged)	...	0.001	...	0.069 **	...	0.069 **
Family income growth	...	0.041	...	-0.021	...	0.068 ***
Fathers with university degree at landing	...	-0.064	...	-0.072	...	-0.197 ***
Fathers not speaking English or French	...	-0.039	...	0.013	...	-0.099 ***
Source-country gross domestic product per capita (logged)	...	-0.003	...	0.027 ***	...	0.021 ***
	value					
R squared	0.005	0.160	0.008	0.177	0.006	0.193

... not applicable
* significantly different from reference category (p<0.05)
** significantly different from reference category (p<0.01)
*** significantly different from reference category (p<0.001)

Notes: Model 2 also controls for geographic region of residence and 12 occupation categories. The sample size is 17,286 for 0 to 5 years of age, 32,213 for 6 to 12 years of age, and 28,765 for 13 to 17 years of age. The reference group is 'skilled workers' for immigration class, 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, 'graduate degree' for educational attainment, and 'United States' for source region.
Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

4.4 Variations by source region within major admission classes

The analysis in the above sections shows that source region was a major factor in accounting for differences by admission class in the educational outcomes of childhood immigrants, and that there were strong variations in the outcomes of childhood immigrants across source regions when admission class was taken into account. These results suggest that admission class and immigrant source region are interconnected, yet each has its independent effects on the outcomes of childhood immigrants.

This section further examines the extent to which the outcomes of childhood immigrants vary by source region within each major admission class. To avoid small sample sizes, detailed admission classes are aggregated to three broad categories: the economic class, including skilled workers and business immigrants; the family class; and refugees, including the four refugee classes. Live-in caregivers are not examined in this section because they are highly concentrated in one source country—over 80% of them came from the Philippines.

Table 10 presents the within-class frequency distribution of childhood immigrants, their educational attainment and their earnings by source region. In the economic class (see the top third of Table 10), 59.2% of childhood immigrants came from Asia, mostly East Asia (29.1%). In terms of high-school graduation rates, the differences by source region were generally small. The average high-school graduation rates ranged from 93.4% to 98.0%, with the exception of childhood immigrants from Southern Europe, whose average rate was 85.8%. The group differences were very large in the university completion rates. Childhood immigrants from East Asia had the highest rate (65.2%), followed by those from South Asia (57.2%) and West Asia (55.4%). Those from Southern Europe had the lowest university completion rate (28.1%). There were also clear differences in average earnings by source region; immigrants from Northern Europe had the highest ($52,100), and those from Southern Europe had the lowest ($41,300).

Table 10
Within-class variations in outcomes for childhood immigrants, by source region

	Within-class frequency distribution	High-school graduation rate	University completion rate	Average annual earnings
		percent		2010 constant dollars
Economic class				
United States	1.7	96.1	53.4	43,500
Caribbean	2.2	97.3	39.0	42,100
Central and South America	4.3	93.8	40.1	44,000
Northern Europe	9.0	96.8	40.4	52,100
Western Europe	4.5	95.8	42.5	47,700
Southern Europe	5.2	85.8	28.1	41,300
Eastern Europe	6.6	97.7	52.4	43,800
Africa	6.8	97.5	54.0	49,700
South Asia	7.5	98.0	57.2	47,700
Southeast Asia	11.4	96.6	40.8	45,900
East Asia	29.1	98.0	65.2	45,700
West Asia	11.2	96.9	55.4	46,800
Oceania and other	0.5	93.4	35.4	48,500
Family class				
United States	1.6	88.3	25.3	40,500
Caribbean	18.0	90.3	14.0	36,400
Central and South America	10.4	83.9	13.7	37,400
Northern Europe	1.7	92.4	31.8	49,600
Western Europe	0.7	90.9	31.3	45,600
Southern Europe	3.3	68.0	11.3	41,800
Eastern Europe	12.2	95.0	32.9	44,400
Africa	4.3	93.6	28.1	38,400
South Asia	18.8	88.2	21.7	36,600
Southeast Asia	17.9	86.7	17.4	40,000
East Asia	5.8	89.9	38.1	40,900
West Asia	4.3	84.7	25.1	39,600
Oceania and other	1.0	88.4	8.5	34,900
Refugees				
Caribbean	2.5	91.1	20.9	32,600
Central and South America	18.2	90.3	18.6	36,900
Southern Europe	7.3	90.1	28.6	37,000
Eastern Europe	17.7	96.5	43.1	46,800
Africa	6.3	92.7	28.8	34,200
South Asia	9.4	92.3	33.9	37,300
Southeast Asia	23.5	86.0	25.5	44,200
East Asia	2.3	91.2	33.0	39,500
West Asia	12.7	90.3	28.9	36,900

Notes: Refugees from the United States, Northern Europe, Western Europe, and Oceania and other are excluded because of small sample size. The total sample size is 34,529 for the economic class, 19,994 for the family class, and 15,225 for refugees.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

The source-region distribution of family-class childhood immigrants (see the middle third of Table 10) was quite different from that of economic-class immigrants. South Asia, Southeast Asia and the Caribbean were the three major source regions, each accounting for 17.9% to 18.8% of childhood immigrants, while East Asia only accounted for 5.8% in the family class. The difference in high-school graduation rates by source region was larger in the family class than in the economic class. While only 68.0% of family-class childhood immigrants from Southern Europe

graduated from high school, 95.0% of those from Eastern Europe did so. The pattern of source-region differences in university completion rates in the family class was similar to that observed in the economic class. Family-class immigrants from East Asia had the highest university completion rate (38.1%), while low rates were observed for those from Oceania (8.5%), Central and South America (13.7%) and the Caribbean (14.0%). In terms of earnings, family-class childhood immigrants from Europe generally had an advantage over those from Asia, Africa, the Caribbean, and Central and South America.

Most of the childhood immigrants in the refugee class came from Southeast Asia, Central and South America, and Eastern Europe (see the bottom third of Table 10). Within the refugee class, those from Eastern Europe had the highest high-school graduation rate, university completion rate, and average annual earnings. Those from Central and South America and the Caribbean had both low university completion rates and annual earnings.

Table 11 presents marginal effects estimated from probit models with high-school graduation as the outcome variable. The purpose of this table is to show to what extent the selected explanatory variables could account for the observed differences by source region in the outcome. Childhood immigrants from Eastern Europe were used as the reference group for the set of dummy variables representing source region because they were a large group in each broad admission class. In general, the adjusted differences by source region were similar to the observed differences, with a few exceptions: (1) the included covariates accounted for about 40% of the gap of childhood immigrants from Southern Europe in the economic class; and (2) the gaps of childhood immigrants from the United States, Northern Europe and the Caribbean in the family class would have been even larger if they had not had the benefit of the official language ability of their fathers. In terms of the effects of the covariates, the disadvantage of arriving at an older age was much larger for refugees than for economic-class immigrants.

Table 11
Marginal effects from probit models on high-school graduation, by major immigration class

	Economic class		Family class		Refugees	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
			marginal effect			
United States	-0.015	-0.015	-0.067 **	-0.177 ***	...	...
Caribbean	-0.004	-0.016	-0.047 ***	-0.077 ***	-0.054 *	-0.038
Central and South America	-0.039 ***	-0.036 ***	-0.111 ***	-0.125 ***	-0.063 ***	-0.049 ***
Northern Europe	-0.009	-0.010	-0.026	-0.097 **	...	...
Western Europe	-0.019 *	-0.013	-0.042	-0.086	...	...
Southern Europe	-0.119 ***	-0.074 ***	-0.271 ***	-0.225 ***	-0.065 ***	-0.074 ***
Africa	-0.001	-0.010	-0.014	-0.027	-0.038 **	-0.015
South Asia	0.004	-0.008	-0.068 ***	-0.053 ***	-0.042 ***	-0.014
Southeast Asia	-0.011 *	-0.017 **	-0.083 ***	-0.057 ***	-0.106 ***	-0.088 ***
East Asia	0.003	0.001	-0.051 ***	-0.043 **	-0.054 **	-0.039 *
West Asia	-0.008	-0.020 *	-0.103 ***	-0.127 ***	-0.062 ***	-0.039 ***
Oceania and other	-0.043 *	-0.044 *	-0.066 *	-0.096 *	...	...
Female	...	0.018 ***	...	0.028 ***	...	0.028 ***
Years since immigration	...	0.000	...	0.000	...	0.000
0 to 5 years of age at landing	...	0.018 ***	...	0.045 ***	...	0.070 ***
6 to 12 years of age at landing	...	0.014 ***	...	0.038 ***	...	0.052 ***
English or French mother tongue	...	0.006	...	0.033 **	...	0.003
Family market income at entry (logged)	...	-0.018 *	...	-0.029	...	0.030 *
Family income growth	...	0.000	...	0.006	...	0.028 **
Fathers with university degree at landing	...	0.009	...	0.060 *	...	0.046
Fathers not speaking English or French	...	-0.035 **	...	-0.091 ***	...	0.020
Source-country gross domestic product per capita (logged)	...	-0.001	...	0.013 *	...	0.000
			value			
Pseudo R squared	0.049	0.073	0.030	0.058	0.025	0.055

... not applicable
* significantly different from reference category (p<0.05)
** significantly different from reference category (p<0.01)
*** significantly different from reference category (p<0.001)

Notes: Model 2 also controls for geographic region of residence. The sample size is 34,529 for the economic class, 19,994 for the family class, and 15,225 for refugees. The reference group is 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, and 'Eastern Europe' for source region.
Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Similarly, the included covariates did not account for much of the observed differences by source region in university completion rates within each broad admission class (Table 12). The gaps of some groups, such as economic-class childhood immigrants from the Caribbean and Southeast Asia, became larger after controlling for the covariates. The effect of age at landing on the university completion rate was larger for refugees than for economic-class immigrants.

Table 12
Marginal effects from probit models on university completion, by major immigration class

	Economic class		Family class		Refugees	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	marginal effect					
United States	0.010	-0.035	-0.076 *	-0.110 ***	...	...
Caribbean	-0.134 ***	-0.229 ***	-0.189 ***	-0.181 ***	-0.222 ***	-0.215 ***
Central and South America	-0.123 ***	-0.160 ***	-0.192 ***	-0.167 ***	-0.245 ***	-0.218 ***
Northern Europe	-0.120 ***	-0.158 ***	-0.011	-0.057	...	...
Western Europe	-0.100 ***	-0.119 ***	-0.016	-0.051	...	...
Southern Europe	-0.244 ***	-0.213 ***	-0.216 ***	-0.194 ***	-0.145 ***	-0.108 **
Africa	0.015	-0.055 *	-0.048 *	-0.014	-0.143 ***	-0.126 ***
South Asia	0.048 **	-0.039	-0.112 ***	-0.031	-0.092 ***	-0.053
Southeast Asia	-0.116 ***	-0.172 ***	-0.155 ***	-0.092 ***	-0.176 ***	-0.171 ***
East Asia	0.128 ***	0.101 ***	0.052 **	0.108 ***	-0.101 **	-0.079 *
West Asia	0.030	-0.067 **	-0.078 ***	-0.074 **	-0.142 ***	-0.086 ***
Oceania and other	-0.170 ***	-0.208 ***	-0.244 ***	-0.212 ***	...	...
Female	...	0.109 ***	...	0.057 ***	...	0.082 ***
Years since immigration	...	0.001	...	0.003 **	...	0.005 **
0 to 5 years of age at landing	...	0.082 ***	...	0.099 ***	...	0.120 ***
6 to 12 years of age at landing	...	0.047 ***	...	0.050 ***	...	0.080 ***
English or French mother tongue	...	-0.001	...	0.015	...	-0.003
Family market income at entry (logged)	...	-0.106 ***	...	-0.038	...	0.061 *
Family income growth	...	-0.058 **	...	0.018	...	0.040 **
Fathers with university degree at landing	...	0.044	...	0.004	...	0.019
Fathers not speaking English or French	...	-0.223 ***	...	-0.043	...	-0.045
Source-country gross domestic product per capita (logged)	...	-0.003	...	0.020 ***	...	-0.007
	value					
Pseudo R squared	0.037	0.054	0.035	0.052	0.026	0.052

... not applicable

* significantly different from reference category ($p<0.05$)

** significantly different from reference category ($p<0.01$)

*** significantly different from reference category ($p<0.001$)

Notes: Model 2 also controls for geographic region of residence.The sample size is 34,529 for the economic class, 19,994 for the family class, and 15,225 for refugees. The reference group is 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, and 'Eastern Europe' for source region.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

There were large differences between the observed and adjusted differences in earnings by source region (Table 13). In the economic class, several source-region groups had significantly higher average earnings than childhood immigrants from Eastern Europe—the reference group—before adjusting for covariates. However, once differences in covariates were adjusted for, these group differences became either not significant or changed sign. This was because childhood immigrants from Eastern Europe had stayed fewer years in Canada (and thus were younger when the age at landing is held constant) than most other groups. The average length of stay in Canada was 17 years for childhood immigrants from Eastern Europe, but 23 years for those from the United States or Western Europe and 25 years for those from Northern Europe. In the family class and refugee class, the changes between the observed differences by source region and the adjusted ones were mostly attributable to differences in the educational attainment and occupational distribution of childhood immigrants.

Table 13
Regression models on earnings, by major immigration class

	Economic class		Family class		Refugees	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	log earnings					
Intercept	10.342 ***	9.172 ***	10.392 ***	9.797 ***	10.413 ***	9.903 ***
United States	-0.046	-0.178 ***	-0.175 **	-0.221 ***	...	...
Caribbean	0.016	-0.108 *	-0.205 ***	-0.081	-0.344 ***	-0.199 ***
Central and South America	0.017	-0.020	-0.160 ***	-0.035	-0.203 ***	-0.018
Northern Europe	0.188 ***	-0.121 **	0.110	-0.063	...	...
Western Europe	0.077 *	-0.121 ***	0.054	0.081	...	...
Southern Europe	-0.004	0.011	0.004	0.113 *	-0.186 ***	0.052
Africa	0.093 **	-0.015	-0.204 ***	-0.106 *	-0.276 ***	-0.027
South Asia	0.089 **	0.023	-0.173 ***	-0.076	-0.215 ***	-0.035
Southeast Asia	0.104 ***	0.049	-0.069 **	0.008	-0.040	0.038
East Asia	0.045	-0.055 *	-0.152 ***	-0.160 ***	-0.166 **	-0.014
West Asia	0.027	-0.015	-0.239 ***	-0.153 **	-0.278 ***	-0.067
Oceania and other	0.130	-0.097	-0.236 ***	-0.113	...	...
Female	...	-0.169 ***	...	-0.319 ***	...	-0.248 ***
Years since immigration	...	0.039 ***	...	0.031 ***	...	0.036 ***
0 to 5 years of age at landing	...	-0.446 ***	...	-0.350 ***	...	-0.404 ***
6 to 12 years of age at landing	...	-0.167 ***	...	-0.123 ***	...	-0.198 ***
English or French mother tongue	...	0.004	...	0.052 *	...	0.019
Less than high school	...	-0.449 ***	...	-0.420 ***	...	-0.458 ***
High-school graduation	...	-0.305 ***	...	-0.314 ***	...	-0.336 ***
Some postsecondary education	...	-0.185 ***	...	-0.190 ***	...	-0.214 ***
Bachelor's degree	...	-0.010	...	0.010	...	-0.022
Family market income at entry (logged)	...	0.101 **	...	0.047	...	0.013
Family income growth	...	0.041	...	0.003	...	-0.024
Fathers with university degree at landing	...	-0.210 ***	...	0.063	...	0.051
Fathers not speaking English or French	...	-0.154 **	...	0.052	...	0.007
Source-country gross domestic product per capita (logged)	...	0.019 ***	...	0.015	...	0.027 **
	value					
R squared	0.003	0.176	0.010	0.172	0.014	0.174

... not applicable

* significantly different from reference category ($p<0.05$)

** significantly different from reference category ($p<0.01$)

*** significantly different from reference category ($p<0.001$)

Notes: Model 2 also controls for geographic region of residence and 12 occupation categories. The sample size is 28,865 for the economic class, 16,052 for the family class, and 12,367 for refugees. The reference group is 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, 'graduate degree' for educational attainment and 'Eastern Europe' for source region.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

5 Conclusion and discussion

This study seeks to determine whether immigrant admission class—the channels through which immigrants are admitted into Canada—is a salient factor in differentiating the educational attainment and earnings of the children of immigrants, and, if so, what the possible differentiation mechanisms are.

The analysis results confirm that childhood immigrants from different admission classes attained very different levels of education, particularly in terms of completing a university degree, and this in turn led to large variations in average earnings by admission class.

Childhood immigrants in the business class and skilled-worker class had the highest high-school graduation rates, university completion rates and annual earnings. Childhood immigrants in the live-in caregiver class had a university completion rate that was about one-third of the rate for the business class, and their average earnings were the lowest. Childhood immigrants in the family class also had a low university completion rate and low earnings. Furthermore, childhood immigrants in the live-in caregiver class and family class had lower university completion rates than Canadian-born children of non-immigrant parents. Clearly, the general observation that the children of immigrants outperform the children of non-immigrants does not apply to the children of immigrants in the live-in caregiver and family classes. Children of refugees had a much lower university completion rate than those of immigrants in the business and skilled-worker classes, but they achieved a higher rate than those of immigrants in the live-in caregiver and family classes.

Less than one-half of the gap in university completion for childhood immigrants in the live-in caregiver class and family class was associated with their individual demographic characteristics and the family background factors available to this study, primarily source region and the education of parents. Over one-half to two-thirds of the gap for children of government-assisted refugees and privately sponsored refugees was accounted for by the included covariates, primarily parents' education, language, and source region. Undoubtedly, other factors that this study was unable to include could also have contributed to the observed class differences, and these factors are possibly specific to each admission class.

For childhood immigrants in the live-in caregiver class, separation from their mothers has been found to be a major factor (Kelly 2014). Under the live-in caregiver program, parents cannot bring their immediate families with them. They must complete a two-year work requirement before they can apply for permanent residence, at which time they may bring their children to Canada. The actual time it takes to acquire permanent status and eventually bring a family over tends to be much longer than two years. The high concentration of these immigrants in low-skilled occupations (primarily domestic caregiving) could also be a contributing factor.

Childhood immigrants in the family class could also experience separation if they were initially left behind by parents who came first as economic immigrants or refugees.

Unlike the pattern observed for the family class and live-in caregivers, parents' education, language and source region accounted for most of the gap in the educational attainment of government-assisted and privately sponsored refugee children. These results, together with the fact that, on average, refugee children had higher university completion rates than children in the third generation or higher, suggest that refugee children are a resilient group, and most of them are well integrated into Canadian society. This is consistent with evidence from some previous studies (Beiser 1999; Wilkinson 2002). The remaining gap that was not accounted for by family socioeconomic background is likely related to the effects of their refugee experience, including exposure to persecution, violence and a dangerous living environment before arriving in Canada (Beiser 1999; Kapreilian-Churchill 1996; Wilkinson 2002).

The study results show that the education and official language ability of parents played a major role in explaining group differences in educational outcomes, but the income of parents after immigration did not contribute much to the group differences. This is consistent with the findings of some previous studies (Picot and Hou 2013; Finnie 2012). However, the superior outcomes for children of business immigrants may suggest that the effect of wealth may not have been well understood. Relative to other classes, business immigrant parents did not have particularly high levels of education and official language ability, and their post-migration income in Canada was low. But, their children did better than children in other classes. Maybe family wealth, rather than income after immigration, better represents the overall economic resources that the family can use to live in affluent local communities, send children to the best schools and extracurricular activities, and seek additional educational support if needed.

Another important finding of this study is that differences by admission class in the educational outcomes of childhood immigrants were smaller for pre-school-aged arrivals than for adolescent arrivals. This pattern results primarily from the varying role of parents' ability in the official language. While the official language proficiency of parents did not matter to pre-school-aged arrivals, its effect was substantial on adolescent arrivals. This suggests that early exposure to the host society helps to mitigate the effect of parents' lack of official language ability, since young children can easily master the official language without the help of their parents through the education system and interaction with their peers. However, the effect of the education of parents was strong and consistent across groups by age at arrival. This is likely because much of this effect on the outcomes for children is through aspirations, expectations and role models; these intermediate mechanisms are less likely to vary with the age of children at arrival.

The study also finds that source country was a major factor in accounting for differences by admission class in educational outcomes. Furthermore, considerable variation by source region exists in the outcomes of childhood immigrants within each admission class. Further studies are needed to disentangle the source-country effect and examine the extent to which source-country cultural values and socioeconomic characteristics are transferred to childhood immigrants and the second generation.

The finding that the educational attainment and occupational distribution of childhood immigrants accounted almost entirely for the large earnings variations between childhood immigrants in different admission classes demonstrates clearly that educational levels and fields of study play a key role in transmitting the socioeconomic status of parents to the labour market outcomes of children. This finding also suggests that improving the educational attainment of the children of immigrants from a disadvantaged socioeconomic background is crucial for ensuring that all children of immigrants have equal opportunities for economic success.

Future studies should pay more attention to how post-migration experiences affect the outcomes of children of immigrants, particularly in terms of ethnic community, neighbourhood and school contexts. Theoretical and empirical studies originating primarily from the United States suggest that the local communities where immigrants live influence whom their children interact with, and this affects their children's identity, social norms and motivations. Whether the same applies to Canada remains to be carefully examined.

In conclusion, this study shows that the admission class of parents matters to their children's educational and earnings outcomes. The effects of the admission class of parents work partly through differences in parents' education and official language ability. Other possible mechanisms include factors that are specific to the unique pre- and post-migration circumstances experienced by each admission class.

6 Appendix

Appendix Table 1
Marginal effects from probit models on university completion for childhood immigrants 25 to 44 years of age

	Model 1	Model 2	Model 3
		marginal effect	
Business class	0.084 ***	0.074 ***	0.076 ***
Live-in caregiver class	-0.170 ***	-0.170 ***	-0.184 ***
Family class	-0.192 ***	-0.189 ***	-0.188 ***
Government-assisted refugees	-0.074 ***	-0.079 ***	-0.080 ***
Privately sponsored refugees	-0.076 ***	-0.076 ***	-0.077 ***
Refugees landed in Canada	-0.132 ***	-0.134 ***	-0.144 ***
Other refugees and humanitarian class	-0.126 ***	-0.121 ***	-0.108 ***
Others	-0.111 ***	-0.108 ***	-0.108 ***
Class not identified	-0.109 ***	-0.107 ***	-0.105 ***
Female	0.083 ***	0.083 ***	0.083 ***
0 to 5 years of age at landing	0.083 ***	0.084 ***	0.084 ***
6 to 12 years of age at landing	0.054 ***	0.054 ***	0.053 ***
Years since immigration	0.003 ***	0.004 ***	0.004 ***
English or French mother tongue	0.013 *	0.013 *	0.011 *
Visible minority	0.056 ***	0.056 ***	0.056 ***
Caribbean	-0.109 ***	-0.107 ***	-0.104 ***
Central and South America	-0.104 ***	-0.104 ***	-0.095 ***
Northern Europe	-0.032	-0.031	-0.020
Western Europe	0.017	0.018	0.022
Southern Europe	-0.028	-0.029	-0.023
Eastern Europe	0.151 ***	0.149 ***	0.148 ***
Africa	0.031	0.035	0.051 *
South Asia	0.045 *	0.047 *	0.061 **
Southeast Asia	-0.028	-0.027	-0.024
East Asia	0.212 ***	0.209 ***	0.227 ***
West Asia	0.066 **	0.062 **	0.081 **
Oceania and other	-0.119 ***	-0.118 ***	-0.109 ***
Family market income at entry (logged)	0.022 *	0.022	0.021
Family income growth	0.048 ***	0.041 ***	0.041 ***
Parents with university degree at landing	0.107 ***	0.108 ***	0.140 ***
Parents not speaking English or French	-0.073 ***	-0.075 ***	-0.079 ***
Source-country gross domestic product per capita (logged)	0.007 ***	0.008 ***	0.007 ***
		value	
Pseudo R squared	0.102	0.102	0.102

* significantly different from reference category (p<0.05)
** significantly different from reference category (p<0.01)
*** significantly different from reference category (p<0.001)

Notes: In Model 1, family income is represented by the father's income, and the education and language ability of parents are derived from fathers. In Model 2, family income is the income of all family members. In Model 3, family income is the income of all family members, and the education and language ability of parents are derived from mothers. All models also control for geographic region of residence. The sample size is 90,601. The reference group is 'skilled workers' for immigration class, 'male' for sex, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, and 'United States' for source region.
Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Appendix Table 2
Comparing regression models based on direct and group links to father's characteristics with identical samples

	High-school graduation		University completion		Earnings	
	Direct link	Group link	Direct link	Group link	Direct link	Group link
	coefficient					
Intercept	0.901 ***	0.568 ***	0.064	-0.372 *	9.800 ***	9.339 ***
Business class	0.019 ***	0.041 ***	0.072 ***	0.106 ***	-0.015	0.002
Live-in caregiver class	-0.015	-0.006	-0.212 ***	-0.226 ***	0.049	0.028
Family class	-0.058 ***	-0.058 ***	-0.185 ***	-0.231 ***	-0.036	-0.040
Government-assisted refugees	-0.004	0.015 *	-0.050 ***	-0.037 **	-0.011	0.016
Privately sponsored refugees	-0.012 *	0.012	-0.056 ***	-0.041 **	-0.026	0.010
Refugees landed in Canada	-0.042 ***	-0.022	-0.116 ***	-0.104 ***	-0.109 *	-0.123 *
Other refugees and humanitarian class	-0.064 ***	-0.043 ***	-0.110 ***	-0.103 ***	0.045	0.054
Others	-0.015	-0.006	-0.258 ***	-0.280 ***	-0.213	-0.183
Family market income at entry (logged)	0.003 ***	0.027 ***	0.012 ***	0.054 ***	0.020 ***	0.061 *
Family income growth	0.005 ***	0.028 ***	0.015 ***	0.038 ***	0.014 ***	0.036 *
Fathers with university degree at landing	0.027 ***	0.037 **	0.180 ***	0.100 ***	-0.052 ***	-0.142 **
Fathers not speaking English or French	-0.033 ***	-0.055 ***	-0.089 ***	-0.125 ***	-0.057 ***	-0.152 ***
Source-country gross domestic product per capita (logged)	-0.003 *	-0.002 *	-0.001	-0.004	0.018 ***	0.022 ***
	value					
R squared	0.050	0.046	0.156	0.122	0.186	0.184

* significantly different from reference category ($p<0.05$)

** significantly different from reference category ($p<0.01$)

*** significantly different from reference category ($p<0.001$)

Notes: Each model in this table also includes controls for sex, age at landing, years since immigration, language, visible minority status, geographic region, and source region. The earnings models also include educational attainment and 12 occupation categories. The sample size is 33,231 for high-school graduation and university completion, and 27,740 for earnings.

Sources: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage and the Longitudinal Immigration Database.

Appendix Table 3
Marginal effects from Probit models on high-school graduation and university completion for childhood immigrants 25 to 44 years of age

	High-school graduation				University completion			
	Men		Women		Men		Women	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	marginal effect							
Business class	0.016 **	0.025 **	0.017 ***	0.023 ***	0.094 ***	0.069 ***	0.092 ***	0.076 ***
Live-in caregiver class	-0.077 ***	-0.031	0.002	0.020 *	-0.327 ***	-0.195 ***	-0.312 ***	-0.153 ***
Family class	-0.085 ***	-0.060 ***	-0.074 ***	-0.055 ***	-0.261 ***	-0.175 ***	-0.317 ***	-0.202 ***
Government-assisted refugees	-0.060 ***	-0.017	-0.042 ***	-0.010	-0.194 ***	-0.072 ***	-0.227 ***	-0.085 ***
Privately sponsored refugees	-0.044 ***	-0.008	-0.056 ***	-0.027 **	-0.175 ***	-0.059 *	-0.189 ***	-0.094 ***
Refugees landed in Canada	-0.065 ***	-0.059 **	-0.029 **	-0.014	-0.201 ***	-0.147 ***	-0.205 ***	-0.120 ***
Other refugees and humanitarian class	-0.081 ***	-0.039 ***	-0.052 ***	-0.015 *	-0.216 ***	-0.112 ***	-0.263 ***	-0.131 ***
Others	-0.099 ***	-0.070 **	-0.053 **	-0.037	-0.158 ***	-0.123 ***	-0.144 ***	-0.096 **
Class not identified	-0.092 ***	-0.060 ***	-0.073 ***	-0.048 ***	-0.166 ***	-0.097 ***	-0.210 ***	-0.115 ***
0 to 5 years of age at landing	...	0.025 ***	...	0.038 ***	...	0.032 ***	...	0.135 ***
6 to 12 years of age at landing	...	0.025 ***	...	0.028 ***	...	0.025 ***	...	0.082 ***
Years since immigration	...	0.002 **	...	0.000	...	0.006 ***	...	0.001
English or French mother tongue	...	0.026 ***	...	0.030 ***	...	0.012	...	0.014
Visible minority	...	0.073 ***	...	0.061 ***	...	0.056 ***	...	0.055 ***
Caribbean	...	-0.018	...	0.015	...	-0.139 ***	...	-0.080 ***
Central and South America	...	-0.058 *	...	-0.043 *	...	-0.124 ***	...	-0.090 ***
Northern Europe	...	0.039 *	...	0.039 *	...	-0.054 *	...	-0.017
Western Europe	...	0.047 *	...	0.047 **	...	-0.025	...	0.054 *
Southern Europe	...	0.010	...	0.011	...	-0.067 *	...	0.001
Eastern Europe	...	0.077 ***	...	0.074 ***	...	0.066 **	...	0.222 ***
Africa	...	0.037	...	0.009	...	-0.007	...	0.071 **
South Asia	...	-0.004	...	0.002	...	0.011	...	0.076 **
Southeast Asia	...	-0.026	...	0.005	...	-0.075 **	...	0.015
East Asia	...	0.025	...	0.032	...	0.150 ***	...	0.262 ***
West Asia	...	0.014	...	-0.001	...	0.021	...	0.095 ***
Oceania and other	...	0.006	...	0.005	...	-0.138 ***	...	-0.103 **
Family market income at entry (logged)	...	0.005	...	0.006	...	0.000	...	0.043 **
Family income growth	...	0.025 ***	...	0.024 ***	...	0.030 **	...	0.051 ***
Fathers with university degree at landing	...	0.069 ***	...	0.063 ***	...	0.137 ***	...	0.079 **
Fathers not speaking English or French	...	-0.035 **	...	-0.025 *	...	-0.070 **	...	-0.080 ***
Source-country gross domestic product per capita (logged)	...	0.001	...	0.005 *	...	0.005	...	0.010 **
				value				
Pseudo R squared	0.037	0.090	0.042	0.112	0.051	0.088	0.060	0.113

... not applicable

* significantly different from reference category (p<0.05)

** significantly different from reference category (p<0.01)

*** significantly different from reference category (p<0.001)

Notes: Model 2 also controls for geographic region of residence. The reference group is 'skilled workers' for immigration class, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, and 'United States' for source region.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

Appendix Table 4
Regression models on earnings of childhood immigrants 25 to 44 years of age, by sex

	Men		Women	
	Model 1	Model 2	Model 1	Model 2
	log earnings			
Intercept	10.493 ***	9.389 ***	10.318 ***	9.633 ***
Business class	-0.016	0.003	-0.043 *	-0.057 **
Live-in caregiver class	-0.280 ***	-0.057	-0.246 ***	-0.130 *
Family class	-0.092 ***	-0.004	-0.182 ***	-0.034 *
Government-assisted refugees	-0.078 ***	-0.025	-0.165 ***	-0.020
Privately sponsored refugees	-0.033	-0.052 *	-0.063 *	-0.005
Refugees landed in Canada	-0.279 ***	-0.068 *	-0.363 ***	-0.116 **
Other refugees and humanitarian class	-0.225 ***	-0.043	-0.200 ***	0.001
Others	-0.046	-0.005	-0.028	0.012
Class not identified	-0.035 **	-0.007	-0.114 ***	-0.042 **
0 to 5 years of age at landing	...	-0.414 ***	...	-0.339 ***
6 to 12 years of age at landing	...	-0.172 ***	...	-0.117 ***
Years since immigration	...	0.036 ***	...	0.034 ***
English or French mother tongue	...	0.013	...	0.030 *
Visible minority	...	-0.082 ***	...	0.062 **
Less than hign school	...	-0.326 ***	...	-0.579 ***
High-school graduation	...	-0.233 ***	...	-0.419 ***
Some postsecondary education	...	-0.122 ***	...	-0.270 ***
Bachelor's degree	...	0.022	...	-0.055 ***
Caribbean	...	0.049	...	-0.040
Central and South America	...	0.170 ***	...	0.024
Northern Europe	...	0.075	...	0.079 *
Western Europe	...	0.018	...	0.039
Southern Europe	...	0.137 ***	...	0.177 ***
Eastern Europe	...	0.107 **	...	0.183 ***
Africa	...	0.127 **	...	0.060
South Asia	...	0.181 ***	...	0.074
Southeast Asia	...	0.200 ***	...	0.145 ***
East Asia	...	0.044	...	0.100 *
West Asia	...	0.115 **	...	0.068
Oceania and other	...	0.117	...	0.039
Family market income at entry (logged)	...	0.065 ***	...	0.039
Family income growth	...	0.016	...	0.014
Fathers with university degree at landing	...	-0.139 ***	...	-0.086 *
Fathers not speaking English or French	...	-0.015	...	-0.072 **
Source-country gross domestic product per capita (logged)	...	0.025 ***	...	0.015 **
		value		
R squared	0.005	0.172	0.008	0.172

... not applicable

* significantly different from reference category ($p<0.05$)

** significantly different from reference category ($p<0.01$)

*** significantly different from reference category ($p<0.001$)

Notes: Model 2 also controls for geographic region of residence and 12 occupation categories. The sample size is 38,166 for men, and 35,598 for women. The reference group is 'skilled workers' for immigration class, '13 to 17 years' for age at landing, 'other mother tongues' for mother tongue, 'graduate degree' for educational attainment, and 'United States' for source region.

Source: Statistics Canada, authors' calculations based on data from the 2011 National Household Survey and Immigrant Landing File linkage.

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